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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/650,409	MAO, XIADONG	
	Examiner	Art Unit	
	Jason R. Kurr	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) *1-6 and 14-19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-13 and 20-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/20/04 6/9/05 12/12/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Claims 1-6 and 14-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on March 7, 2007.

Drawings

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the present drawings are of poor quality. Figures 1-8 contain hand written labels and reference numbers that are difficult to read. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7-11, 13, 25-29 and 35-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Erten (US 2002/0009203 A1).

With respect to claim 7, Erten discloses a method for reducing noise associated with an audio signal received through a microphone sensor array (fig.21 "m1, m2"), comprising: enhancing a target signal component (fig.21 #2102) of the audio signal through a first filter (fig.21 "W1,W0"); blocking the target signal component through a second filter (fig.21 #2104, "W1,W0"); combining an output of the first filter and an output of the second filter in a manner to reduce noise without distorting the target signal (pg.8 [0096-0099]); periodically monitoring an acoustic set-up associated with the audio signal (pg.3 [0048] ln.11-20); and calibrating both a value of the first filter and a value of the second filter based upon the acoustic set-up (pg.5 [0062-0066]).

With respect to claim 8, Erten discloses the method of claim 7, further comprising: defining the target signal component (S(t)) and a noise signal component (Nɵ(t)) through second order statistics (pg.5 [0064-0066]).

With respect to claim 9, Erten discloses the method of claim 8, further comprising: separating the target signal component and the noise signal component (pg.5 [0068]); and determining a time delay associated with each microphone sensor of the microphone senor array (pg.5 [0063-0064]).

With respect to claim 10, Erten discloses the method of claim 7, wherein the method operation of combining the output of the first filter and the output of the second filter in a manner to reduce noise without distorting the target signal includes, aligning the output of the second filter (pg.8 [0098]).

With respect to claim 11, Erten discloses the method of claim 7, wherein the acoustic set-up refers to relative position of a user and the microphone sensor array (pg.4 [0057][0059]).

With respect to claim 13, Erten discloses the method of claim 7, wherein the method operation of calibrating both a value of the first filter and a value of the second filter based upon the acoustic set-up includes, applying a blind source separation scheme using second order statistics associated with the audio signal (pgs.2-3 [0043-0045], pg.5 [0067]).

With respect to claim 25, Erten discloses a system capable of isolating a target audio signal from multiple noise sources, comprising: a portable consumer device configured to move independently from a user (pg.1 [0006]); a computing device (pg.5 [0062], fig.21 "W0, W1"), the computing device including logic configured enhance the target audio signal without constraining movement of the portable consumer device (pg.2 [0015-0016]); and a microphone array (fig.21 "m1, m2") affixed to the portable consumer device, the microphone array configured to capture audio signals, wherein a listening direction associated with the microphone array is controlled through the logic configured to enhance the target audio signal (pg.4 [0059]).

With respect to claim 26, Erten discloses the system of claim 25, wherein the computing device is contained within the portable consumer device (pg.2 [0016]).

With respect to claim 27, Erten discloses the system of claim 26, wherein the computing device includes, logic for blocking the target signal through a second filter; logic for combining the output of the first filter and the output of the second filter in a

manner to reduce noise without distorting the target signal (pg.8 [0096-0099]); logic for periodically monitoring an acoustic set up associated with the audio signal (pg.3 [0048] ln.11-20); and logic for calibrating both the first filter and the second filter based upon the acoustic setup (pg.5 [0062-0066]).

With respect to claim 28, Erten discloses the system of claim 25, wherein the microphone array is configured in one of a convex geometry and a straight line geometry (pg.4 [0056-0059].

With respect to claim 29, Erten discloses the system of claim 25, wherein a distance between microphones of the microphone array is about 2.5 centimeters (pg.4 [0060]).

With respect to claim 35, Erten discloses an integrated circuit, comprising: circuitry (fig.21) configured to receive an audio signal from a microphone array (fig.21 "m1, m2") in a multiple noise source environment; circuitry configured to enhance a listening direction signal; circuitry configured to block the listening direction signal; circuitry configured to combine the enhanced listening direction signal and the blocked listening direction signal to yield a noise reduced signal (pg.8 [0096-0099]); and circuitry configured to adjust a listening direction according to filters computed through an adaptive array calibration scheme (pg.8 [0098]).

With respect to claim 36, Erten discloses the integrated circuit of claim 35, wherein the adaptive array calibration scheme applies a second order statistic to data associated with the audio signal to derive one of a signal passing filter and a blocking filter (pg.8 [0098]).

With respect to claim 37, Erten discloses the integrated circuit of claim 35, wherein the adaptive array calibration scheme is periodically invoked. It is implied that an adaptive filter such as the LMS filter of Erten periodically updates its' calibrations, hence "adaptive".

With respect to claim 38, Erten discloses the integrated circuit of claim 35, wherein the circuitry configured to combine the enhanced listening direction signal and the blocked listening direction signal to yield a noise reduced signal includes, circuitry configured to align the enhanced listening direction signal with the blocked listening direction signal (fig.21, pg.8 [0098]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 12 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erten (US 2002/0009203 A1).

With respect to claim 12, Erten discloses the method of claim 7, however does not disclose expressly wherein the method operation of periodically monitoring an acoustic set-up associated with the audio signal includes occurs about every 100 milliseconds. Official Notice is taken that it is well known in the art to update filter

parameters at significantly short time period so as to update the system with relevant data pertaining to constantly changing unknowns. At the time of the invention it would have been obvious to a person of ordinary skill in the art to update the system of Erten about every 100 milliseconds. The motivation for doing so would have been to account for any movement of the desired sound or of the sounds associated with noise.

With respect to claim 20, Erten discloses a method for reducing noise associated with an audio signal, comprising: a method for enhancing a target signal (fig.21 #2102) associated with a listening direction through a first filter (fig.21 "W1,W0"); a method for blocking the target signal through a second filter (fig.21 #2104)(fig.21 "W1,W0"); a method for combining an output of the first filter and an output of the second filter in a manner to reduce noise without distorting the target signal (pg.8 [0096-0099]); a method for periodically monitoring an acoustic set up associated with the audio signal (pg.3 [0048] ln.11-20); and a method for calibrating both the first filter and the second filter based upon the acoustic setup (pg.5 [0062-0066]). Erten discloses that the methods for extracting voice signals can be implemented using a digital signal processing system composed of FIR and IIR filters. Erten does not disclose expressly wherein the method includes a computer readable medium having program instructions for performing the method. Official Notice is taken that it is well known in the art that digital filters may be implemented as program instructions on a computer. At the time of the invention it would have been obvious to a person of ordinary skill in the art that the methods of Erten could be implemented as instructions on a computer. The motivation for doing so would have been to allow the invention of Erten to be distributed as a software update

to a personal computer. This would allow a user to upgrade their voice recognition applications without the need to purchase external hardware such as digital filters.

With respect to claim 21, Erten discloses the computer readable medium of claim 20, further comprising: program instructions for defining the target signal component (S(t)) and a noise signal component (Nɵ(t)) of the audio signal through second order statistics (pg.5 [0064-0066]).

With respect to claim 22, Erten discloses the computer readable medium of claim 21, further comprising: program instructions for separating the target signal component and the noise signal component (pg.5 [0068]); and program instructions for determining a time delay associated with each microphone sensor of the microphone senor array (pg.5 [0063-0064]).

With respect to claim 23, Erten discloses the computer readable medium of claim 20, wherein the program instructions for combining the output of the first filter and the output of the second filter in a manner to reduce noise without distorting the target signal includes, program instructions for aligning the output of the second filter (pg.8 [0098]).

With respect to claim 24, Erten discloses the computer readable medium of claim 20, wherein the program instructions for calibrating both a value of the first filter and a value of the second filter based upon the acoustic set-up includes, program instructions for applying a blind source separation scheme using second order statistics associated with the audio signal (pgs.2-3 [0043-0045], pg.5 [0067]).

Claims 30-34 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erten (US 2002/0009203 A1) in view of Varma et al (US 2004/0213419 A1).

With respect to claim 30, Erten discloses the system of claim 25, however does not disclose expressly wherein the portable consumer device is a video game controller and the computing device is a video game console.

Varma discloses a noise reduction system for voice applications wherein the portable consumer device is a video game controller and the computing device is a video game console (fig.1, pg.1 [0005]).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the system of Erten in a video game controller and console as taught by Varma.

The motivation for doing so would have been to increase the intelligibility of voice commands spoken by a user of a video game for the purpose of controlling a function of the video game. The noise reduction system would allow for a user to continue playing a game with voice commands even in the event of interfering background noises.

With respect to claim 31, Erten discloses an electronic system, comprising: a microphone array (fig.21 "m1, m2") affixed to the electronic system, the microphone array configured to detect an audio signal that includes a target audio signal and noise (pg.5 [0068]); circuitry configured to process the audio signal (fig.21); and filtering and enhancing logic configured to filter the noise and enhance the target audio signal as a position of the electronic system, and a position of a source of the target audio signal

change (pg.5 [0062-0065]), wherein the filtering of the noise is achieved through a plurality of filter-and-sum operations (fig.21, pg.8 [0096-0099]).

Erten does not disclose expressly wherein the electronic system is a video game controller.

Varma discloses a noise reduction system for voice applications wherein the electronic system is a video game controller and the computing device is a video game console (fig.1, pg.1 [0005]).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the system of Erten in a video game controller and console as taught by Varma.

The motivation for doing so would have been to increase the intelligibility of voice commands spoken by a user of a video game for the purpose of controlling a function of the video game. The noise reduction system would allow for a user to continue playing a game with voice commands even in the event of interfering background noises.

With respect to claim 32, Erten discloses the video game controller of claim 31, wherein the filtering and enhancing logic includes, separation filter logic configured to separate the target audio signal from the noise through a blind source separation scheme (pg.8 [0096], pg.5 [0067]).

With respect to claim 33, Erten discloses the video game controller of claim 32, wherein the blind source separation scheme is associated with a second order statistic derived from data corresponding to the audio signal (pg.5 [0067]).

With respect to claim 34, Erten discloses the video game controller of claim 32, wherein the separation filter logic includes, adaptive array calibration logic configured to periodically calculate a separation filter value, the separation filter value capable of adjusting a listening direction associated with the microphone array (pg.5 [0062-0066]).

With respect to claim 39, Erten discloses the integrated circuit of claim 35, however does not disclose expressly wherein the integrated circuit is contained within one of a video game controller and a video game console.

Varma discloses a noise reduction system for voice applications wherein the electronic system is a video game controller and the computing device is a video game console (fig.1, pg.1 [0005]).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the system of Erten in a video game controller and console as taught by Varma.

The motivation for doing so would have been to increase the intelligibility of voice commands spoken by a user of a video game for the purpose of controlling a function of the video game. The noise reduction system would allow for a user to continue playing a game with voice commands even in the event of interfering background noises.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Licht (US 2004/0057586 A1) discloses a voice enhancement system.

Gonopolskiy et al (US 7,142,677 B2) discloses a directional sound acquisition system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason R. Kurr whose telephone number is (571) 272-0552. The examiner can normally be reached on M-F 10:00am to 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 273-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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